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XXIV.—*Remarks upon British Plants.*

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SINCE the publication of the third edition of my 'Manual of British Botany,' my attention has been directed to several groups of plants, either by the discovery of new native species, or by finding that I have taken an erroneous view of them in that work. In this paper the results of the study which I have devoted to the plants included in it are presented to the Botanical Society.

1. THALICTRUM MAJUS and T. MINUS.

The *Thalictra*, which usually pass under the names of *T. majus* and *T. minus* in Britain, seem to be very imperfectly understood, and probably constitute three distinct species. In my 'Manual' (ed. 3) I have given *T. minus*, *T. flexuosum*, *T. saxatile*, and *T. majus* as native species, but now think that that is one too many, and that the so-called *T. majus* is formed out of larger states of each of the others, but especially of *T. saxatile* and *T. flexuosum*. I must however protest against the extreme measure of joining all these *Thalictra* under the name of *T. minus*, as is done in the 'British Flora' (ed. 6), and can only account for it by supposing that the justly celebrated botanists who are the authors of that work were unacquainted with some of the plants.

In drawing up the following revised characters for our plants I have been greatly assisted by my friend Mr. F. J. A. Hort, who has paid much attention to these species, and freely communicated to me the results at which he has arrived.

Attention should be especially directed to the presence or not of leaves from the lower joinings of the stem, as it appears to be

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quite certain that some species are when young always furnished with leaves quite down to the ground, whilst others have only scales in their place. The former at the flowering season present a deceitful appearance, for then the lower leaves have usually faded and often quite disappeared. A careful examination is therefore requisite before deciding upon their presence or absence; also, those joinings that are covered with soil are usually, even in the leaf-based species, devoid of leaves and furnished with scales alone. Dried specimens of the leaf-based species are therefore very liable to be mistaken for leafless-based plants.

My observations do not lead me to place much dependence upon the hollowness or otherwise of the stem, as it often, I think, seems to be hollow, owing to the vigour of its growth having distended and broken the pith. I am not prepared to say that none of the species are normally hollow-stemmed.

The auricles of the larger stipules, especially the lower ones, are well deserving of attention, as they seem to furnish valuable characters.

The direction of the subdivisions of the petioles is deserving of attention, but the form of the leaflets and their size appear to be very inconstant.

The direction of the branches of the panicle should be noticed.

The form of the carpels is probably of little value, but before this can be stated with confidence, they must be subjected to careful study when fresh. The process of drying appears to alter their form considerably.

1. *T. minus* (Linn.); stem zigzag striated branched solid leafless at the base, stipules with inflexed auricles, leaves 2-3-pinnate, leaflets ternate 3-cleft glaucous, petioles with angular ascending branches, panicle leafless with divaricate branches, flowers drooping, carpels fusiform 8-ribbed subcompressed ventricose below externally.

T. minus, Koch, *Syn.* ed. 2. 4; *Fries, Summa*, 135; *Reich. Icon. Fl. Germ.* iii. t. 27!

T. majus, *Reich. l. c.* t. 30.

This plant varies very much in size, but is usually about 18 inches in height. Its leaves are rather small, with short intervals between the leaflets; but this is not constantly the case, as in specimens gathered in Cambridgeshire the leaflets are distant, and thus cause the plant to present a different appearance. There is usually a very marked interval between the root and the lowest leaf, the lower joinings of the stem being furnished with sheathing rather lax scales, but no leaves. The main branches of the panicle usually spring from the axils of very small leaves,

at the secondary divisions there are rarely more than scales, therefore the upper part of the stem looks naked and the panicle may be described as leafless. The panicle is usually small relatively to the size of the plant, but in a specimen from the Great Ormes Head it is very large and very much more branched than is usual. In this last-mentioned instance, and in some from other parts of Caernarvonshire, the stem is much softer and almost might be called hollow when the plant is in fruit.

The *T. majus* of Reichenbach (*l. c.*) seems to be a large form of this species; that of Gren. and Godr. (*Fl. de France*) is rendered doubtful by the statement that it is "sans stolons." When this plant is clothed with minute stalked glands, it is the *T. pubescens* of Schleicher and DeCandolle.

T. minus appears to be pretty generally distributed, but seems to prefer the neighbourhood of the sea. It is found upon sand-hills adjoining the coast, and also in hilly or even mountainous situations.

In the 'Botanical Gazette' Mr. J. Ball informs us that M. ^[1849. i. 312] Jordan of Lyons considered that a plant gathered upon Ben Bulbin, in the county of Sligo, is his *T. calcareum* (*Obs. sur Pl. de la France*, v. 9). Not having seen either the Irish plant or that of M. Jordan, I am unable to form a clear idea of it, but suspect that it is very nearly allied to *T. minus*.

2. *T. flexuosum* (Reichenb.); stem zigzag striated branched leafy to the base, stipules with reflexed auricles, leaves 2-3-pinnate, leaflets 3-5-cleft paler beneath, petioles with patent divaricate branches, panicle leafy elongated with patent often reclinate branches, flowers drooping, carpels narrowly oblong subcompressed sub-10-ribbed gibbous within upwards.

T. flexuosum, "Bernh. Cat." ex Reich. *Fl. excurs.* 728, et *Ic. Fl. Germ.* iii. 14. t. 28; *Fries, Summa*, 136, et *Herb. Norm.* vii. 24!

T. collinum, *Wallr. Sched.* 259. teste Reich.

T. capillare, Reich. *Fl. excurs.* 729, et *Ic. Fl. Germ.* iii. 15. t. 36.

T. majus, *Sm. Eng. Bot.* t. 611, et *Eng. Fl.* iii. 42.

Varying greatly in size, but usually a taller plant than *T. minus*, often 3 feet in height. In the lesser forms the leaves are rather small, and the leaflets placed rather closely; but in the larger plants the latter are often very distant. The leaflets are very inconstant in size, they are usually roundish, and on the same plant vary from subcordate at the base to wedge-shaped; the lobes are very blunt and cuspidate, or in the larger forms, and especially in *T. capillare*, the lobes of the upper leaflets are lanceolate-cuspidate. All the sheaths that are not subterranean are furnished with leaves; but the lower leaves soon decay, and thus it is rendered difficult at an advanced period of the year to

ascertain their former existence. The primary and secondary branches of the panicle are usually to a far greater extent furnished with leaves, which are also larger, than is the case in *T. minus*, and small ones, consisting of from one to three small leaflets, are frequently found subtending even the ultimate branchlets. This tendency of the panicle to become leafy distinguishes the present plant from both *T. minus* and *T. saxatile*, in which it always looks naked. The panicle is rather large, usually very much subdivided, and in the larger forms has very long pedicels.

My specimens named *T. majus* from North Queensferry in Scotland (Hook. Fl. Scot. i. 172), and Ulleswater (Sm. Eng. Fl. iii. 42, and Eng. Bot. t. 611), are, I am confident, the *T. capillare*, although I only possess a portion of the upper part of these large plants. I quite agree with Fries in thinking that they are a luxuriant state of *T. flexuosum*.

There is much reason to suppose that what is called *T. minus* in the interior of England chiefly consists of this plant, but I can only state the certain presence of its smaller form in Cambridgeshire and at Cheddar in Somersetshire, and its larger form in Fifeshire and Cumberland. I am informed that Mr. D. Oliver, jun., has observed it upon Ben Bulbin* in the county of Sligo; and Mr. Shuttleworth found it at Curragh More, Lough Corrib, Co. Galway; Mr. Brand at Grey Mare's Tail, Dumfriesshire; and Dr. Greville (I believe) at Far Out Head, Sutherlandshire.

3. *T. saxatile* (DC.); stem rather zigzag smooth but striated below the striated sheaths branched hollow leafy to the base, "stipules with horizontal auricles" (Fries), leaves 2-3-pinnate, leaflets 3-5-cleft paler beneath, petioles subterete with patent not divaricate branches, panicle leafless erect pyramidal with patent straight branches, flowers drooping (?), carpels regularly oval.

T. saxatile, DeCand. Fl. Fr. v. 633; Reich. Ic. Fl. Germ. iii. 15. t. 34; Gren. et Godr. Fl. Fr. i. 7 (excl. syn.).

T. Kochii, Fries, Mant. iii. 46, et Summa, 136.

T. collinum, "Wallr." teste Fries, Herb. Norm. vii. 25; Koch, Syn. ed. 1. 4.

A large plant with stems often 4 feet in height. Leaves very large, with long intervals between the leaflets. Leaflets large, broad, closely resembling those of *T. flexuosum*. None of the sheaths are leafless, they are furrowed, and the furrows descend a short distance upon the stem, which is elsewhere without furrows. The secondary branches are so generally unfurnished with leaves that the panicle may be called leafless, although there are leaves at the origin of the principal branches. It is not quite certain if the flowers are erect or drooping; in a plant gathered

* = same as Ball's "calca-rem" of previous page.

by myself in Cumberland they appear to have been erect, but it is difficult to determine from a dried specimen; they are figured and described by Reichenbach as erect; Fries states that they nod, and his specimen seems to confirm him. The fruit of this plant differs from that of *T. minus* and *T. flexuosum* in being scarcely at all compressed and very regularly oval in its outline.

I have only seen this plant from the Lake district of the north of England, where it is found in damp situations, such as Brathay near Ambleside, and St. John's Vale near Keswick. Mr. J. Ball appears (Bot. Gaz. i. 313) to have found it "abundantly on the shores of the lakes . . . of the limestone districts of the west of Ireland," for I presume that this is the plant which he there calls *T. majus*.

The locality in Somersetshire recorded for this species in my 'Manual' (ed. 3. 4) belongs to *T. flexuosum*. [Cheddar]

2. POLYGALA.

The discovery of *Polygala uliginosa* of Reichenbach, a probable variety of *P. austriaca* of Crantz, upon the elevated mountain limestone of Teesdale by my valued friends Messrs. James Backhouse, sen. and jun., has led me to a more careful examination of the plants referable to that genus that are natives of Britain, and as I have considerably altered the technical characters of *P. vulgaris* and *P. calcarea* from those given in the third edition of my 'Manual' (p. 38 & 39), it seems desirable to give the new specific definitions of them in conjunction with that of *P. austriaca*. Much difficulty attends all the supposed species of *Polygala*, and probably their number will ultimately be much reduced, but we are not as yet in a position to do so satisfactorily.

It will be seen that attention should be especially paid to the mode in which the leaves are arranged, and to the appearances caused by the different lengths to which the stems extend each year. In some cases the leaves are pretty regularly scattered over the stems; in others some are scattered, but the larger ones are collected into a marked tuft arranged in the form of a rose at the end of the growth of the year. When this extension is slight, the rosette appears to be radical and includes all the foliage of the true stem, as is the case in *P. austriaca*; when it is elongated its lower part bears small scattered leaves, and the rosette of larger ones is placed at its extremity, a habit presented by *P. calcarea*. In *P. vulgaris* a third condition is seen, where there is no marked distinction between the persistent part of the stem and the deciduous floral portion. The stems of *P. vulgaris* seem usually to die back nearly to the crown of the root, so as to leave only two or three of the lowest buds to produce the

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shoots of the succeeding year ; but sometimes they retain life to a considerable distance from their origin, and then the new growth is far distant from the root-stock and prostrate stems are produced. In this plant, and others of similar habit, there is no rosette.

1. *P. vulgaris* (Linn.); *leaves scattered, lower leaves smaller oblong, upper leaves lanceolate, wings of the calyx obovate mucronate their nerves branched the lateral looping with a branch of the central nerve, capsule obovate, lobes of the arillus unequal, lateral bracts shorter than the pedicels.*

P. vulgaris auctorum.

Stems weak, prostrate or ascending, without any clear separation between the persistent part and the annual flowering shoot ; sometimes branching so as to make some of the really terminal racemes appear to be lateral. Leaves all scattered, the lower ones much the smaller. Flowers blue, pink or white, with intermediate shades. The central nerve of the wings of the calyx is very nearly simple, only branching slightly near the top, and ending in a mucro. The lateral nerves are much branched, but only on their outer side, where the branches join in loops, as do the nerves themselves with a branch of the central nerve. The lobes of the arillus are unequal, the two lateral being longer than the central one, and half as long as *the seed, which has a kind of stalk* that raises it so as to leave a space between its base and the inside of the arillus.

β . *depressa* ; lower leaves crowded and often opposite but small, stems long wiry prostrate, racemes ultimately lateral.

*P. vulgaris** *depressa*, *Fries, Mant.* ii. 41.

P. depressa, "*Wend.*" ex *Koch, Syn.* ed. 2. 99 ; *Coss. et Germ. Fl. Par.* 56. t. 8 ; *Bromf. in Phytol.* ii. 966 ; *Gren. et Godr. Fl. Fr.* i. 196.

P. serpyllacea, "*Weihe*" ex *Sond. Fl. Hamb.* 388.

I have examined this plant with care, but do not find any cause for deviating from the opinion of Fries, confirmed as it is by the accurate observations of my lamented friend Dr. Bromfield. As has been remarked in the preliminary observations, the long wiry character of the stems is caused by some of the buds more distant from the root remaining alive through the winter and producing shoots in the succeeding spring. Similar wiry stems are occasionally, although rarely, found in typical *P. vulgaris*.

γ . *oxyptera* ; flowers smaller, fruit broader than the wings of the calyx.

P. oxyptera, *Reich. Iconog.* i. f. 46!

P. multicaulis, *Tausch.*!

This appears to be only a variety of *P. vulgaris*, the propor-

tional width and length of the calyx-wings and capsule not being to be trusted.

In my 'Manual' I have directed attention to a plant that grows on the limestone ledges of Ben Bulbin in the county of Sligo, and which I have long suspected might be a distinct species. It is remarkable for having deep blue flowers, upright stems, much larger leaves than the typical *P. vulgaris*, and the lateral nerves of the calyx-wings joining the central nerve itself instead of a lateral branch of it. Although looking very different, and being even more beautiful than the common *P. vulgaris*, I have now arrived at the conclusion that it ought not to be separated from that species. Is its situation upon the ledges of limestone in a damp country a sufficient cause for the above-mentioned differences? I am inclined to answer that it is.

P. vulgaris is found throughout the British Isles, upon every kind of soil, and from near the level of the sea to a high elevation on mountains.

2. *P. calcarea* (Schultz); leaves chiefly in an irregular terminal tuft large obovate obtuse, leaves on the flower-shoot smaller lanceolate, wings of the calyx oblong their nerves branched the lateral looping with a branch from near the middle of the central nerve, capsule oblong obovate, lobes of the arillus unequal, lateral bracts shorter than the pedicels.

P. calcarea, Schultz in *Bot. Zeit.* (1837) 752, et "Exsic. ii. 15"; Koch, *Syn.* ed. 2. 100; Bab. *Man.* 39; Gren. et Godr. *Fl. Fr.* i. 196!; Walp. *Rep.* i. 232.

P. amara, Reich. *Fl. exc.* 350, et *Fl. exsic.* 749!; *Eng. Bot.* t. 2764!

P. amarella, Reich. *Iconog.* i. f. 43, 44; Coss. et Germ. *Fl. Par.* 56. t. 7.

Stems weak, prostrate or ascending, nearly naked below, producing simple flower-shoots from the terminal rosette which loses its leaves and disappears. Racemes terminal. Flowers blue. The central nerve of the wings of the calyx branching considerably, one of its lower branches joining in a loop with the lateral nerves, which are much branched, but only externally. The lobes of the arillus are unequal, blunt, the two lateral being longer than the central one, and half as long as the seed, which is sessile.

This plant is closely allied to *P. vulgaris*, and is joined to it by some authors of eminence; but it is perhaps as frequently, and by botanists of equal authority, combined with *P. amara*. Fries expresses his opinion strongly that the former is the correct view to take of it (*Summa*, 154), and similarly Arnott (*Brit. Fl.* ed. 6. 52). Bertoloni combines it and *P. uliginosa* and *P. austriaca* with the true *P. amara* (*Fl. Ital.* vii. 321); as is also done by the editors of the 'Compendium Fl. German.' (ed. 2. 157).

In my opinion it is equally distinct from each of them. Its naked elongated true stems, bearing a rosette of leaves at their extremity from the axils of which the simple flower-shoots spring, seem to separate it clearly from the former in which no such rosette is found, and at the flowering season the lowest leaves are very markedly smaller than those above them.

With *P. amara* it agrees in possessing a rosette; but in that species the true stem is very short, and therefore the rosette and flower-shoots seem to be radical. Here also the central nerve of the calyx-wings is branched even as low down as its middle, and these lower branches join with the lateral nerves; in *P. amara* the central nerve is unbranched up almost to its apex, although it usually does there join the lateral nerves.

P. calcarea is found on the chalk hills of Surrey and Berkshire.

3. *P. austriaca* (Crantz); leaves in a rosette obovate obtuse larger than the oblong-lanceolate ones on the flower-shoot, wings of the calyx oblong or obovate obtuse their nerves simple or slightly branched free, capsule wedgeshaped below roundish broader than the wings, lobes of the arillus nearly equal, lateral bracts shorter than the pedicels.

[*α. genuina*; leaves of the rosette smaller than those of the branching flower-shoot, flowers smaller, capsule rounded below.

P. austriaca, "Crantz, *Aust.* v. 2"; *Reich. Iconog.* i. 23. t. 21. f. 39, et *Fl. excurs.* 350, et *Fl. exsic.* 1923!]

β. uliginosa; leaves of the rosette larger than those of the nearly constantly simple flower-shoot, flowers larger, capsules wedge-shaped.

P. uliginosa, *Reich. Iconog.* i. 23. t. 21. f. 40, 41, et *Fl. excurs.* 350, et *Fl. exsic.* 52!; *Fries, Summa*, 154, et *Herb. Norm.* iii. 14!

P. myrtifolia, *Fries, Nov. ed.* 2. 227; *Wimm. et Grab. Fl. Siles.* iii. 24.

P. amara, *Sven. Bot.* t. 484; *Fl. Dan.* t. 1169.

P. austriaca, *Coss. et Germ. Fl. Par.* 56. t. 7, not *Reich.*

Root slender. Root-stock short. Lower leaves collected into a rosette and seeming to be radical, larger than the others, broadly obovate, narrowed below, rounded at the end, but often with a minute apiculus. Flowering shoots short, springing from the axils of the rosette, straight, unbranched; their leaves oblong-lanceolate, upper ones acute. Flowers small, pale lilac, or at length tinged with green. Wing of the calyx longer than the capsule in our plant, and in that of Scandinavia (*Fries, Nov. et Herb. Norm.*) shorter than it in southern countries. The valueless character of the proportion between these parts is well pointed out in the 'Flora Silesiæ' (*l. c.*).

Fries considers this to be the plant called *P. myrtifolia pa-*

lustris humilis et ramosior by Dillenius (Raii Syn. *287), and found by Sherard "in the bog beyond the wood going from John Coals to Croydon bogs." It is quite possible that his idea may be correct, as the description accords pretty well with *P. uliginosa*. It may however be doubted if Sherard's plant was not *P. calcarea*, which inhabits the range of chalk hills to the south of Croydon, and agrees even better than *P. austriaca* with the description given in the 'Synopsis.' Smith takes no notice of this Dillenian plant; it is mentioned by Hudson, and in the second edition of Withering's 'Botanical Arrangement,' but neither botanist seems to have known more about it than may be learned from Ray's 'Synopsis.' It is to be feared that the neighbourhood of Croydon is far too much altered to allow of the discovery of the spot visited by Sherard, and unless a specimen is preserved at Oxford, the *P. myrtifolia palustris humilis et ramosior* can never be identified with modern species.

Much doubt exists concerning the propriety of separating *P. uliginosa* from *P. austriaca*. The true *P. austriaca* does not seem to grow in the north of Europe. The recorded differences between them are very slight, and are of a kind that is likely to be variable. In *P. austriaca* the lateral nerves of the wings are usually branched and their points incline towards the central nerve: in *P. uliginosa* these lateral nerves are, I believe, nearly always simple and do not curve inwards, but continue to diverge up to their extremity. The true *P. austriaca* has not been found in this country.

This plant was discovered "at the back of Cronkley Fell, Upper Teesdale, Yorkshire, at an elevation of about 1500 feet above the sea," on May 24, 1852, by Messrs. James Backhouse, sen. and jun.

The presence of this plant; of *Myosotis alpestris*, which was discovered by the same botanists, during the same excursion, at an elevation of 2500 feet upon Micklefell; and their previous detection of *Alsine stricta* upon Widdy-bank Fell in June 1844; all places in the same mountainous district of the north of England; is a subject of much interest in connection with the geographical distribution of our plants. It is the most southern extension in Britain of the three species (indeed the only station known for two of them), each of which appears to have derived its origin from Scandinavia, or perhaps, to use more correct terms, is a remnant of that ancient flora of Britain which inhabited the country when its climate nearly resembled that now found in Norway.

[To be continued.]